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Redescription of *Leptus (Leptus) mariani* HAITLINGER 1991 and *L. (L.) stefani* HAITLINGER 1991 (Trombidiformes: Prostigmata: Erythraeidae)

Ryszard HAITLINGER & Miloje ŠUNDIĆ

A b s t r a c t : *Leptus (Leptus) mariani* HAITLINGER from Brazil, collected on *Stolas festiva* and *L. (L.) stefani* HAITLINGER from Colombia, collected on *Ptychoderes* sp. are redescribed based on the original type material. A key to *Leptus* species from the Neotropical Region is given.

K e y w o r d s : Parasitengona, *Leptus*, redescription, key, Neotropical Region.

Introduction

28 *Leptus* species were stated: in Neotropical Region as follows: *L. (Leptus) lomani* OUDEMANS 1902, *L. (L.) stieglmayri* (OUDEMANS 1905), *L. (L.) gagzoi* (OUDEMANS 1910), *L. (L.) sieversi* (OUDEMANS 1911), *L. (L.) schedingi* (OUDEMANS 1911), *L. (L.) Oudemansi* KARPINEN 1958 [= *L. (L.) gracilipes* (OUDEMANS 1910)], *L. (L.) stolae* HAITLINGER 1987, *L. (L.) ariel* SOUTHOTT 1989, *L. (L.) alberti* (HAITLINGER 1991), *L. (L.) stefani* HAITLINGER 1991, *L. (L.) cyryli* HAITLINGER 1991, *L. (L.) mariani* HAITLINGER 1991, *L. (L.) olafi* HAITLINGER 1991, *L. (L.) ursyni* HAITLINGER 1991, *L. (L.) annikae* HAITLINGER 2000, *L. (L.) filipinae* HAITLINGER 2000, *L. (L.) hringuri* HAITLINGER 2000, *L. (L.) maldonadoicus* HAITLINGER 2000, *L. (L.) nikanori* HAITLINGER 2000, *L. (L.) onnae* HAITLINGER 2000, *L. (L.) simonettae* HAITLINGER 2000, *L. (L.) adaminae* HAITLINGER 2004, *L. (L.) fozicus* HAITLINGER 2004, *L. (L.) iguacuicus* HAITLINGER 2004, *L. (L.) cabareticus* HAITLINGER 2004, *L. (L.) tiranicus* HAITLINGER 2006, *L. (L.) multisolenidia* MAYORAL & BARRANCO 2011 and *L. (Amaroptus) vuki* HAITLINGER 2000 (OUDEMANS 1902, 1905, 1910, 1911, KARPINEN 1958, HAITLINGER 1987, 1991, 2000a, b, 2004a, b, 2006, SOUTHOTT 1989, MAYORAL & BARRANCO 2011b).

In this paper two species: *Leptus (Leptus) mariani* based on two specimens from Brazil and *L. (L.) stefani* based on a single specimen from Colombia are redescribed. Original descriptions of both species were very laconic and drawings were restricted only to scutum, gnathosoma and specialized setae of leg I. The present paper contains descriptions of both species with corrected metric and meristic data and additional measurements. A key to *Leptus* from Neotropical Region is given.

Material and Methods

The larvae were mounted on microscope slides using Berlese medium. Measurements (given in micrometers) were made using microscope NIKON Eclipse 80i. Figures were drawn using Carl Zeiss Axio Scope A1 microscope. The terminology and abbreviations follow HAITLINGER (1999, 2013) and SOUTHCOTT (1992). Additional measurement comprised: AB - distance between centers of bases of ASE and middle of anterior margin of scutum.

Family E r y t h r a e i d a e ROBINEAU-DESVOIDY 1828

Genus *Leptus* LATREILLE 1796

Leptus (Leptus) mariani HAITLINGER 1991

Type material examined: holotype (larva), Brazil, Rio Grande do Sul, Porto Alegre from *Stolas festiva* (KLUG 1829) (Coleoptera: Chrysomelidae: Cassidinae); paratype same data. The holotype and paratype are deposited in Museum of Natural History, Wrocław University (MNHU), Poland.

Diagnosis: Palpfemur and palpgenu each with one seta, 4 setae between coxae II and III, AW 92-94, PW 113-118, AL 70-72, PL 71-79, GL 203-212, Ti III 260-286, ω on Ta I 70.

Redescription (larva): (Standard measurements are presented in Table 1). Dorsal side of idiosoma with ~56 barbed setae (in paratype dorsal side is in very bad condition – number of dorsal setae is unknown). A pair of anterolateral eyes (Fig. 1) posterolateral to scutum. Scutum wider than long, punctate, with almost straight anterior margin, anterolateral angles obtuse, anterolateral borders short, nearly straight; posterolateral borders almost straight. AC = 22-24. Anterior scutalae (AL) and posterior scutalae (PL) each with setules; AL a little shorter than posterior scutalae. Anterior sensilla (ASE) shorter than posterior sensilla (PSE), both distally ciliated. (Fig. 3).

Ventral surface of idiosoma bearing one pair of 1a setae between coxae I, one pair of 2a setae between coxae II and 4 setae between coxae II and III; 20 setae beyond coxae III, all setae barbed. All coxae with one barbed seta. Setae $1b > 3b > 2b$ (Fig. 2).

Gnathosoma. Chelicera composed of basal segment and movable claw. Mouth surrounded with lamellar, narrowing fimbriae. Ventrally, a pair of nude hypostomalae (as), dorsally a pair of nude galealae (cs). Palptrochanter without setae; palpfemur and palpgenu, each with one barbed seta. Palptibia with 3 barbed setae and odontus. Supracoxalae (elcp) present (Fig. 4). Palptarsus with 1 ω , 1 ζ and 5 nude, normal setae (Fig. 5).

Leg setal formula: Leg I: Ta 1 ω , 2 ζ , 21B; Ti 2 ϕ , 1 κ , 14B; Ge 1 σ , 1 κ , 6B; Tf 5B; Bf 2B; Tr 1B; Cx 1B (Fig. 6). Leg II: Ta 1 ω , 2 ζ , 25B; Ti 2 ϕ , 13B; Ge 1 σ , 8B; Tf 5B; Bf 2B; Tr 1B; Cx 1B (Fig. 7). Leg III: Ta 6B; Ti 1 ϕ , 14B; Ge 8B; Tf 5B; Bf 1B; Tr 1B; Cx 1B (Fig. 8), solenidion I (ω) 70, distal solenidion I (ϕ) 35 μ m, proximal solenidion I (ϕ) 48. Legs length: I 958, II 842, III 999. IP = 2799. Supracoxalae (elc) present on dorsal side, in terminal part of coxae I.

Remarks: *L. (L.) mariani* belongs to the species group (Neotropical Region only) with one palpgenua and palpfemorala, two sternalae between coxae I and coxae II, four

setae between coxae II and III, Ti III with one solenidion and Ti III > 190. This group includes: *L. (L.) tiranicus*, *L. (L.) nikanori*, *L. (L.) annikae* and *L. (L.) cyryli*. It differs from *L. (L.) tiranicus* in longer PW (113-118 vs. 90-102), AL (70-72 vs. 58-66), PL (71-79 vs. 54-62), ISD (69-71 vs. 50-58), GL (203-212 vs. 172-184) and fD (56 vs. 46); from *L. (L.) nikanori* in 6 normal setae on Ge I vs. 8 setae on Ge I and longer ω on palptarsus (23-26 vs. 15), depth of concave of anterior margin of scutum(AB) (2-3 vs. 8) and shorter *as* (27-30 vs. 46); from *L. (L.) annikae* in shorter hypostomale *as* (27-30 vs. 50), ASBa (22-24 vs. 31) and longer DS (49-70 vs. 40-48) and from *L. (L.) cyryli* in ω on Ta I (70 vs. 49), Ta I (178 vs. 124), Ta II (152 vs. 130), Ta III (177 vs. 130) and leg I (958 vs. 832).

***Leptus (Leptus) stefani* HAITLINGER 1991**

Type material examined: holotype (larva), locality unknown, Colombia from *Ptychoderes* sp. (Coleoptera : Anthribidae). The original description incorrectly listed the host as *Ptychoderes speciosus*, J. The holotype is deposited in Museum of Natural History, Wrocław University MNHWU, Poland.

Diagnosis: One palpfemorala and palpenuala, 4 setae between coxae II-III, AW 119, PW 150, AL 95, PL 121, GL 277, Ti III 360, Ta III with 2 ϕ .

Redescription (larva): (Standard measurements are presented in Table 1). Dorsal side of idiosoma with 42 barbed setae. A pair of anterolateral eyes, not on platelets (Fig. 9). Scutum slightly wider than long, punctuate with cuticular line at base of posterior sensillae (PSE). Anterior border straight, posterolateral borders slightly concave. Scutalae AL and PL each with numerous setules. Anterior sensillae (ASE) distinctly shorter than posterior sensillae, both with setules in distal half (Fig. 11).

Ventral surface of idiosoma bearing one pair of *1a* setae between coxae I, one pair of *2a* setae between coxae II, 4 setae between coxae II-III and 24 setae beyond coxae III, all setae barbed. Setae *1b* are more than twice as long as setae *2b* and distinctly longer than setae *3b*, all setae barbed (Fig. 10).

Gnathosoma with a pair of smooth hypostomale (*as*) and a pair of smooth galealae (*cs*). Palptrochanter without setae, palpfemur and palpgenu each with one barbed seta. Palptibia with 2 barbed setae, one nude seta and odontus (Fig. 12). Palptarsus with 3 barbed and 3 nude setae, ω and ζ . Supracoxalae (*elcp*) present (Fig. 13).

Leg setal formula: Leg I: Ta 1 ω , 2 ζ , 21B; Ti 2 ϕ , 1 κ , 14B; Ge 1 σ , 1 κ , 8B; Tf 5B; Bf 2B; Tr 1B; Cx 1B (Fig. 14). Leg II: Ta 1 ω , 2 ζ , 23B; Ti 2 ϕ , 14B; Ge 1 κ , 8B; Tf 5B; Bf 2B; Tr 1B; Cx 1B (Fig. 15). Leg III: Ta 1 ζ , 26B; Ti 2 ϕ , 14B; Ge 8B; Tf 5B; Bf 1B; Tr 1B; Cx 1B (Fig. 16), solenidion I (ω) 48, distal solenidion (ϕ) I 39 μ m, proximal solenidion (ϕ) I 63 μ m. Legs length: I 1244, II 11136, III 1317. IP = 3697. Supracoxalae (*elc*) present on dorsal side, in terminal part of coxae I.

Remarks: *Leptus (Leptus) stefani* belongs to group species (in Neotropical Region only) with one palpgenuala and palpfemorala, two setae between coxae I and coxae II, four setae between coxae II and III and Ti III with two solenidia. In this group is known also *L. (L.) filipinae*. It differs from this species in longer L (174 vs. 92-112), W (190 vs. 86-95), AL (95 vs. 52-58), PL (122 vs. 72-80), ISD (110 vs. 60-64), AP (40 vs. 15-20), GL (277 vs. 172-192) and Ti III (360 vs. 218-238).

Key to the larval *Leptus* of the Neotropical Region

- 1 Scutum with two or more additional scutalae, placed beyond setae PL (subgenus *Amaroptus*)..... *L. (A.) vuki* HAITLINGER 2000; Peru
- Scutum without such setae (subgenus *Leptus*)2
- 2 Palpgenu and palpfemur with two setae each
..... *L. (L.) maldonadoicus* HAITLINGER 2000; Peru
- Palpgenu with one or two setae, palpfemur with only one seta3
- 3 Between coxae I four sternalae, between coxae II six sternalae and between coxae II-III more than four setae *L. (L.) ursyni* HAITLINGER 1991; Chile
- Between coxae I and II two sternalae, between coxae II-III not more than four setae4
- 4 Palpegenu with two setae5
- Palpgenu with one seta 8
- 5 Posterolateral scutal seta (PL) off scutum
..... *L. (L.) lomani* (OUDEMANS 1902); Chile
- Setae PL on scutum6
- 6 $L > 100$, $W > 120$ *L. (L.) hringuri* HAITLINGER 2000; Peru
- $L < 100$, $W < 100$ 7
- 7 $fD\ 60$, $W < 78$, $Ti\ III < 135$
..... *L. (L.) cabareticus* HAITLINGER, 2004; Dominican Republic, Guadeloupe
- $fD\ 82$, $W > 80$, $Ti\ III > \dots$ *L. (L.) iguacuicus* HAITLINGER 2004; Brazil
- 8 Genu III with 7-9 solenidia
..... *L. (L.) multisolenidae* MAYORAL & BARRANCO 2011 French Guiana
- Genu III with other number of solenidia or without solenidia9
- 9 Genu I with five solenidia10
- Genu I with one or no solenidion11
- 10 Genu II with one solenidion, telofemur I without solenidion
..... *L. (L.) stieglmayri* (OUDEMANS 1905); Brazil
- Genu II without solenidion, telofemur with three solenidia
..... *L. (L.) schedingi* (OUDEMANS 1911); Chile
- 11 Tibia III with two12
- Tibia III with one solenidion13
- 12 $L < 130$, $W < 120$, $AL < 70$
..... *L. (L.) filipinae* HAITLINGER 2000; Costa Rica, Belize, Mexico
- $L > 150$, $W > 170$, $AL > 80$ *L. (L.) stefani* HAITLINGER 1991; Colombia
- 13 Genu I without solenidion *L. (L.) gagzoi* (OUDEMANS 1910) Panama, Trinidad
- Genu I with one solenidion14
- 14 Genu II with one solenidion15
- Genu II without solenidia16
- 15 Two setae between and anterior to coxae III
..... *L. (L.) oudemansi* (KARPINEN 1958), Surinam
- Four setae between and anterior to coxae III
..... *L. (L.) sieversi* (OUDEMANS 1911); Venezuela
- 16 $Ti\ III > 450$ *L. (L.) stolae* HAITLINGER 1987; Brazil
- $Ti\ III < 400$ 17
- 17 $Ti\ III < 190$ 18
- $Ti\ III > 190$ 24
- 18 $AW < 66$ *L. (L.) onnae* HAITLINGER 2000; Brazil, Mexico

- AW > 6619
 - 19 AW > 88.....20
 - AW < 88.....21
 - 20 PW 86-90, Ti I 94-100, anterior border of scutum deeply concave.....*L. (L.) adaminae* HAITLINGER 2004; Brazil
 - PW 120, Ti I 122, anterior border of scutum almost straight*L. (L.) alberti* HAITLINGER 1991; Brazil
 - 21 The longest dorsal setae > 50*L. (L.) ariel* SOUTHCOTT 1989; Guatemala, Peru
 - The longest dorsal setae < 4822
 - 22 Anterior border of scutum straight*L. (L.) olafi* HAITLINGER 1991; Chile, Venezuela
 - Anterior border of scutum concave23
 - 23 Ta II < 104, IP 1456-1628*L. (L.) simonettae* HAITLINGER 2000; Guatemala, Honduras
 - Ta II > 104, IP 1822-1880*L. (L.) fozicus* HAITLINGER 2004; Brazil
 - 24 Anterior margin of scutum straight, Ta I < 140.....*L. (L.) cyryli* HAITLINGER 1991; Brazil
 - Anterior margin of scutum concave, Ta I > 140.....25
 - 25 Palptarsus with 3 barbed and 2 nude normal setae*L. (L.) annikae* HAITLINGER 2000; Peru
 - Palptarsus with one barbed seta or without barbed setae.....26
 - 26 PL < 70, ISD < 60, GL < 200.....*L. (L.) tiranicus* HAITLINGER 2006; Venezuela
 - PL > 70, ISD > 60, GL > 210.....*L. (L.) mariani* HAITLINGER 1991; Brazil
 -*L. (L.) nikanori* HAITLINGER 2000; Costa Rica, French Guiana*
- *Only further collection of *L. (L.) mariani* specimens from Brazil can to establish if *L. (L.) nikanori* is synonym of *L. (L.) mariani*
- (OUDEMANS 1902, 1905, 1910, 1911, KARPINEN 1958, HAITLINGER 1987, 1991, 2000a, b, 2004a, b, SOUTHCOTT 1989, MAYORAL & BARRANCO 2011b)

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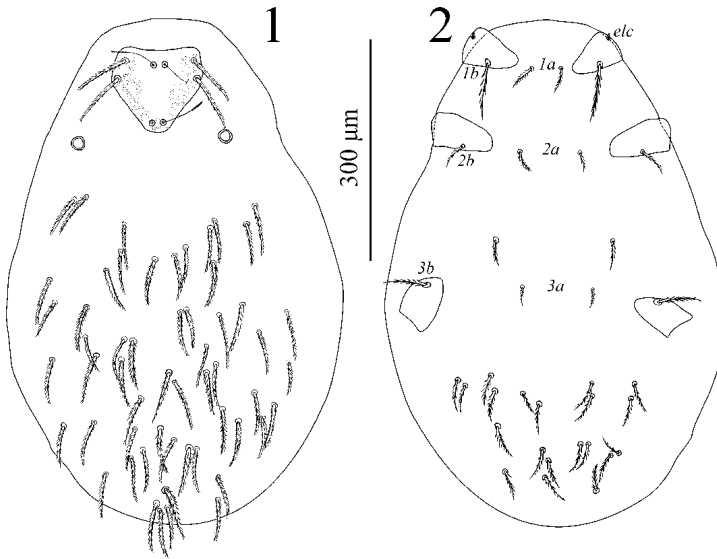
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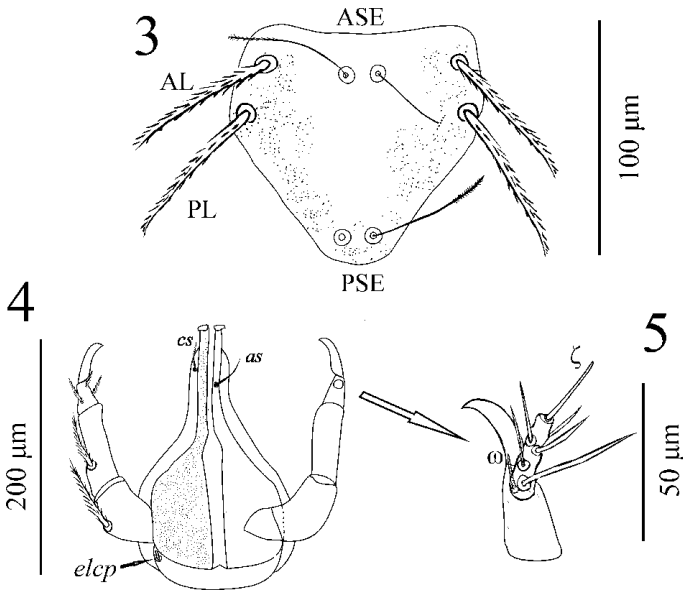
Authors' addresses:

Prof. Dr. habil. Ryszard HAITLINGER
Institute of Biology
Department of Invertebrate Systematics and Ecology
Wrocław University of Environmental and Life Sciences
Kozuchowska 5B
PL-51-631 Wrocław, Poland
E-mail: ryszard.haitlinger@up.wroc.pl

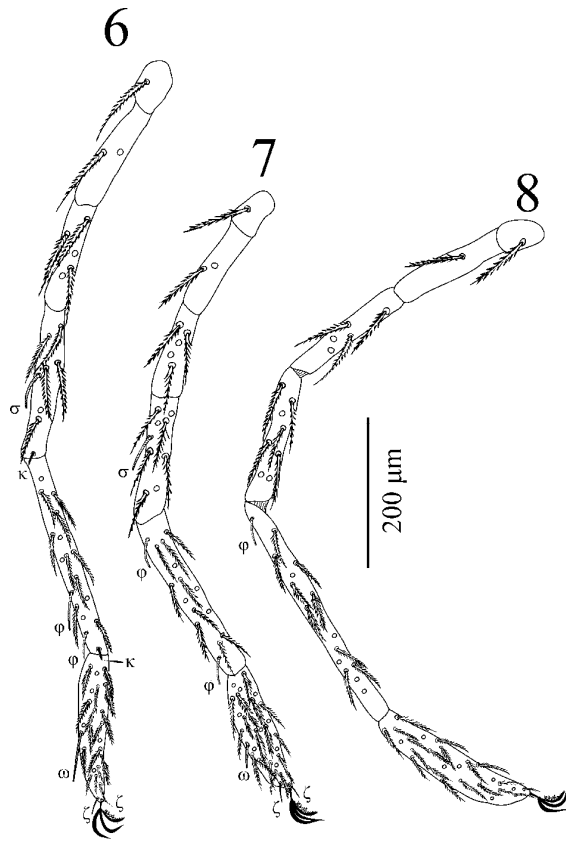
Dr. Miloje ŠUNDIĆ
Department of Biology
Faculty of Sciences and Mathematics
University of Montenegro
G Washington Street, P box 5455
20000 Podgorica, Montenegro
E-mail: miloje@t-comme



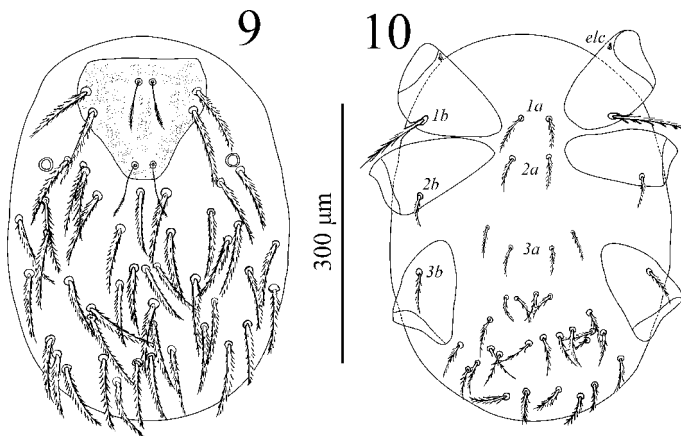
Figs 1-2: *Leptus (Leptus) mariani* HAITLINGER (1) idiosoma, dorsal view; (2) idiosoma, ventral view.



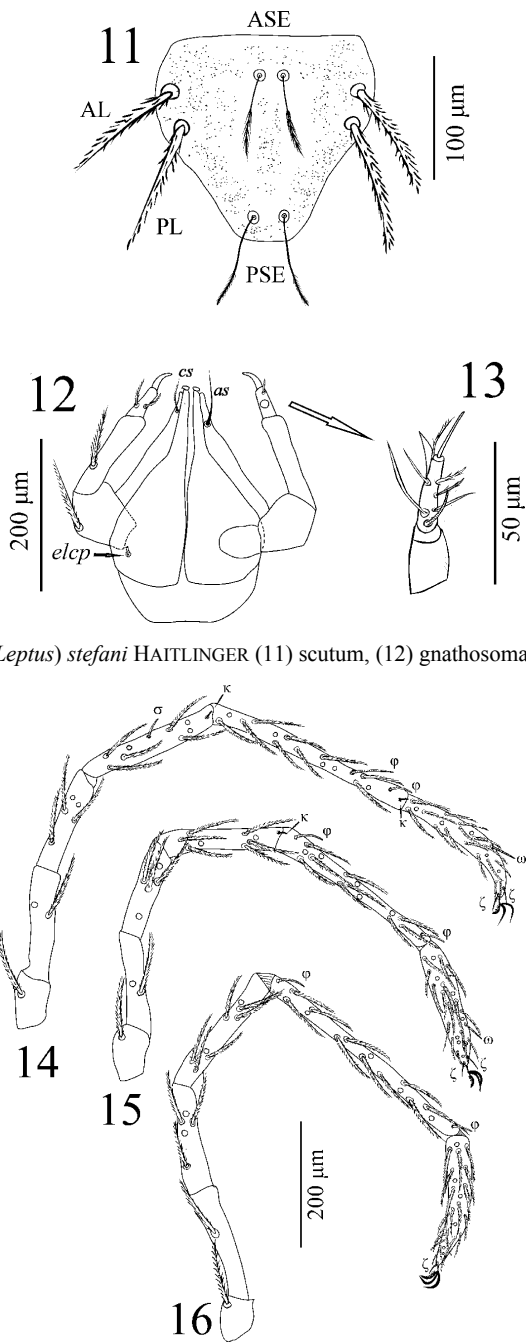
Figs 3-5: *Leptus (Leptus) mariani* HAITLINGER (3) scutum; (4) gnathosoma; (5) palptarsus.



Figs 6-8: *Leptus (Leptus) mariani* HAITLINGER (6) leg I; (7) leg II; (8) leg III.



Figs 9-10: *Leptus (Leptus) stefani* HAITLINGER (9) idiosoma, dorsal view, (10) idiosoma, ventral view.



Figs 11-13: *Leptus (Leptus) stefani* HAITLINGER (11) scutum, (12) gnathosoma, (13), palptarsus.

Fig 14-16: *Leptus (Leptus) stefani* HAITLINGER (14) leg I; (15) leg II (16) leg III.

Table 1. Metric data (in micrometers) for *Leptus (Leptus) stefani* (1) and *L (L) mariani* (2); H – holotype P – paratype.

Character	H 1	H 2	P 2*	Character	H 1	H 2	P 2*
IL	469	729	646	PaGe (L)	108	65	61
IW	317	595	400	PaGe (W)	24	22	19
L	174	98	102	Ta I	210	178	
W	190	128	133	Ti I	312	221	
AW	120	94	92	Ge I	206	172	
PW	150	118	113	Tf I	148	119	
Al	95	72	70	Bf I	168	129	
PL	122	79	71	Tr I	80	59	
ISD	110	69	71	Cx I	120	80	
AP	40	33	20	Ta II	180	152	
AA	22	13	14	Ti II	284	195	
SB	24	15	17	Ge II	182	133	
GL	277	212	203	Tf II	132	106	
DS	78-102	57-63	49-60	Bf II	150	99	
ASE	52	49		Tr II	84	53	
PSE	72	60		Cx II	124	104	
PsFd	98		54	Ta III	205	177	
PsGd	84	53		Ti III	360	286	260
1a	56	52	42	Ge III	208	157	153
2a		44	45	Tf III	180	131	119
3a	34	26	30	Bf III	166	117	118
1b	94	102		Tr III	76	56	57
2b	34	29	35	Cx III	122	75	75
3b	54	47		Leg I	1244	958	
OD	36	37	33	Leg II	1136	842	
as	57	27	30	Leg III	1317	999	
PaFe (L)	77	55	60	IP	3697	2799	
PaFe (W)	63	43	42	cs	11	18	

* with metric data given by MAYORAL & BARRANCO (2011a)